

ALTANA wants to leverage its research expertise with artificial intelligence

Possessing the world's largest high-throughput screening facility, ALTANA has not only brought automation into the research laboratory, but also taken a first step toward using artificial intelligence in the chemistry lab.



ALTANA CEO Martin Babilas brings Big Data into research labs

Photo: ALTANA

A high-throughput screening facility is quite a mouthful. But what's behind it is very impressive. In fully automated high-throughput screening systems, time-consuming series tests can be carried out not only at high speed, but also in the highest quality. While these systems are indispensable for active ingredient research in the pharmaceutical industry, they are rarely used in other sectors.

So, it's all the more surprising that the small specialty chemicals group ALTANA has been operating what the company claims is the world's largest and most versatile HTS facility since the spring of 2021. The system is located at the company's headquarters in Wesel, which is also home to the Group's BYK division. The digital research laboratory is used exclusively to research and test additives for coatings. Occasionally, "hidden stars" are found – in other words, additives that offer a solution that one would not have expected, says Claudia Bramlage, who heads the HTS facility.

The facility fills a space of more than 300 square meters. It has 32 modules with 27 different functionalities. The modules are connected to each other via a rail system. The samples are transported from one module to the next via a shuttle –

fully automatically. A technician sitting in the cockpit monitors the operation and only intervenes if there are malfunctions.

Although automation is standard in the chemical industry, research laboratories have done without it until now. "Since innovation drives ALTANA's business, digitization in research is very important for us. It allows us to leverage the expertise of our research teams," explained ALTANA's CEO Martin Babilas in an interview with *Börsen-Zeitung*.

ALTANA has taken the plunge. It invested a whopping 15 million euros in the facility, and Martin Babilas says the investment is slowly starting to pay off: "We're already seeing a considerable increase in efficiency. We're increasing our speed and, at the same time, the researchers now have more creative freedom," he points out. Because unlike people, the facility works 24/7. Every day, up to 220 samples can be run through it, which adds up to 80,000 samples per year.

Since the process is fully automated, an enormous amount of time is saved. Series tests that used to take months are now completed in just a few days. The capacity in application technology is just doubled, says Bramlage. At the same time, the researchers are given more freedom to pursue creative activities, as series tests are generally an unpopular task that is, however, part of their daily routine.

But automating the lab is only the first step. The most important thing is digitization, which enables the facility to perform many different tests in a breadth and depth that researchers could previously only dream of. "In many cases, we broke new ground with the facility, because in the end, the system is only as good as the data model behind it, which had to be designed before it was built," explains Babilas. The data model must be set up in such a way that it can later be amenable to AI solutions.

Whereas the laboratories previously only had an electronic laboratory notebook, the data from the series tests are now recorded digitally. The advantage: The data is recorded in a more structured way and is more comprehensive – starting with the formulation, through process and application parameters, to additional data such as temperature or humidity. Plus, the fact that many things the application engineers know from experience are now systematically recorded. "The facility offers us the opportunity to make the knowledge and experience of the researchers generally accessible in our R&D via digitalization," says Babilas.

Ultimately, however, the system is of course also about artificial intelligence. After all, once sufficient data is available, test results should be easier to predict and subsequently enable more targeted planning and testing. But it will be some time before this happens. "In terms of data analytics, we are only at the beginning, because the facility is still young and we don't have that much data yet," says Babilas. "Nevertheless, I can already say today that the facility, including the data model, meets our expectations." The goal is to evaluate the data analytically in such a way that it can then be fed back into the R&D process.

ALTANA now wants to venture further into the new territory it has entered with the plant. "We will definitely expand this facility," says Babilas. "And more facilities may be in the offing." He says it is conceivable not only that other locations and areas of application will be explored, but also that it could be used in other business areas. "Before that can happen, however, we first need to gain more experience," says the ALTANA CEO.

Babilas is not worried that the system could make researchers superfluous. After all, he says, it is the people who operate the plant who ultimately decide whether it is a success or a failure. "That's why we set up the facility in Wesel. At this BYK site, every third person works in research and development," explains Martin Babilas. What is changing, however, are the requirement profiles. Particularly at the interface between human and machine, specialist chemical knowledge is no longer sufficient; in the future, handling the digital instruments will be part of the basic knowledge required.

Sustainability

Babilas also sees the fact that the ultramodern plant is located in a country that is currently singing the swansong to industry as symbolic. After all, the HTS system serves to maintain and expand the local knowhow pool. "The path toward sustainability is irreversible. Europe still has a certain lead in this area, and we shouldn't squander it," warns the ALTANA CEO.

As regards sustainability, Babilas sees his company at the cutting edge: "At ATLANA, there's practically no new project that doesn't take sustainability aspects into account. Corresponding criteria are woven into the decision-making processes."